PUPILS' OUTLINES FOR HOME STUDY

IN CONNECTION WITH SCHOOL WORK

GEOGRAPHY, PART III

Mathematical, Physical, Political

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Price, Fifteen Cents

Jennings Publishing Company
P. O. Box 17, Brooklyn, N. Y.

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PRESS OF HUNTER COLLINS, INC.
Brooklyn, N. Y.
Sixth Edition—Feb., 1914—10 M.

375
P96p
v.10

The body on which we live is part of a large system known as

THE SOLAR SYSTEM.

1. **The Sun** is its center.

It is

(*a*) Ninety-two million miles from the earth.

(*b*) The source of the earth's light.

(*c*) The source of the earth's surface heat which the atmosphere helps the earth to retain.

2. THIS SYSTEM INCLUDES:

(a) Planets—Bodies that revolve about the Sun.

The principal planets are:

	(Diameter as compared to the earth's.)	(Distance from Sun in million miles.)
1.	MERCURY—Less than one-half	36
2.	VENUS—About the same size	67
3.	EARTH—7,918 miles	92
4.	MARS—A little more than one-half the size	141
5.	JUPITER—Over eleven times the size	483
6.	SATURN—A little less than ten times the size	886
7.	URANUS—About four times the size	1,781
8.	NEPTUNE—About four and one-half times the size	2,791

The path made by a planet in revolving about the Sun is called its *orbit*.

The orbit of the earth is in the form of an *ellipse*. The earth is *nearest* to the *sun in winter* (91 million miles), and *furthest* away in *summer* (94 million miles). The mean distance from the sun is 92 million miles.

The planets may be distinguished by their clear, steady light, while fixed stars twinkle.

(b) Planetoids—Little planets.

PLANETOIDS are also called ASTEROIDS, and are of comparatively recent discovery. They are invisible to the naked eye, yet with the aid of powerful telescopes about five hundred have been located between Mars and Jupiter.

(c) Satellites—Bodies that revolve around the planets. By some called "Secondary planets."

With the exception of Venus and Mercury, all the planets have satellites or moons.

Earth and Neptune, one.
Mars, two.
Uranus, four.
Jupiter, five.
Saturn, nine; also curiously formed rings.

THE MOON.

Is a satellite of the earth, about 240,000 miles from it. It

(*a*) *Revolves* about the earth from west to east as the earth revolves about the sun.

(*b*) *Makes* a complete revolution about the earth in 29 days.

(*c*) *Receives* its light from the sun.

PHASES:

Are the different forms or shapes the moon presents to us in the sky.

(*a*) *New Moon,* when it is between the sun and the earth.
(*b*) *Full Moon,* when the earth is between it and the sun.
(*c*) *First Quarter,* when it is half way between new and full moon.
(*d*) *Last Quarter,* when it is half way between full and new moon.

The *New Moon* rises about the same time as the sun.
The *Full Moon* rises about the time the sun sets.

The SOLAR SYSTEM is located in that part of the heavens known as the Milky Way. It is only a part of the greater system known as the UNIVERSE.

The planet on which we live is called

THE EARTH.

I. It consists of

(*a*) An *atmosphere* which surrounds it.
(*b*) *land,* and
(*c*) *water,*

of which it is composed. There is three times as much water as land.

II. Form: The form or shape of the earth is nearly that of a sphere.

The *proofs* are:

(*a*) The masts of ships are first seen when approaching us on the ocean and last seen when sailing from us.
(*b*) A person traveling continuously east or west returns to the place from which he started.
(*c*) As we ascend from the surface of the earth the horizon grows larger and the greater is the extent of our view.
(*d*) As we travel from the equator toward the poles, or the reverse, new stars appear to us in the sky.
(*e*) The shadow that the earth casts upon the moon is circular.

The diameter of the earth is 26½ miles shorter at the poles than at the equator.

This is proved by the difference in the length of degrees of latitude. They are shorter at the equator than at the poles.

At the equator the length of a degree is about 68.703+ miles.
At the 45th parallel of latitude it is about 69.054+ miles.

The difference in the equatorial and polar diameters is caused in part by the rotation of the earth on its axis.

A degree of longitude is greater at the equator than it is at the poles.

At the equator a degree is about $69\frac{1}{5}$ miles.
" 20th parallel of latitude it is about 65 miles.
" 40th " " " " 52 "
" 60th " " " " 34½ "
" 80th " " " " 12 "

III. Size: The equatorial diameter is 7,918 miles, while the polar diameter, upon which the earth rotates, is twenty-six and one-half miles shorter.

The circumference of the earth is nearly 25,000 miles at the equator.

It is estimated that the surface of the earth is about 197,000,000 square miles in extent.

IV. **Motions:** There are two principal motions:

(*A*) *Yearly Motion.*

Revolves about the sun—Causing, with the inclination of the earth's axis to the plane of its orbit

1. *Changes in place of seeming sunrise and of sunset.*
2. *The Seasons.*
   - (*a*) Spring, begins about March 21st. Then both poles are presented to the sun. Days and nights are about equal.
   - (b) Summer, in the Northern Hemisphere, begins about June 21st. Then the north pole is in the sunlight, the south pole being out of it.
     The days are longest and the nights shortest.
   - (*c*) Autumn begins about September 21st, when both poles are again in the sunlight. Days and nights are again equal.
   - (*d*) Winter, in the Northern Hemisphere, begins about December 21st, when the north pole that was in the sunlight is out of it and the south pole is in it. The days are the shortest.
     The seasons of the Southern Hemisphere are opposite to those in the Northern.

When in the Southern Hemisphere.	Then in the Northern Hemisphere.
Spring.	Autumn.
Summer.	Winter.
Autumn.	Spring.
Winter.	Summer.

(*B*) *Daily Motion.*

Rotates on its axis from west to east, causing day and night.

There is also an oscillating motion of the poles of the earth, in a circular path. this movement or oscillation causes what is known as the *precession of the equinoxes.*

V. **Gravitation:** A *force* that attracts all bodies to the center of the earth. At the equator it exercises less power than at the poles. This shows that the distance from the center of the earth to its surface is greater at the equator than at the poles.

VI. **Axis of the Earth:** An imaginary straight line upon which the earth rotates passing through the center of the earth and terminating at its surface.

VII. **Poles:** The poles are the extremities of the earth's axis. There are two, the *North Pole,* which points towards the North Star, and the *South Pole.*

VIII. **Direction:** A line extending from pole to pole is said to extend in a *Northerly* and *Southerly* direction.

- (*a*) *Meridians* are lines extending North and South. Lines extending at right angles to the North and South, or to the meridians, are said to extend East and West.
- (*b*) The *Equator and Parallels of Latitude* are East and West lines.

The principal points of direction are *North, East, South and West.* They are called the cardinal points, or Points of the Compass. The sun appears to rise in the east and set in the west.

(*c*) The *Equator* is an imaginary line passing around the surface of the earth, midway between the poles.

(*d*) *Hemispheres* are the two equal parts into which the earth is divided. These parts divided by the equator are known as the Northern and Southern Hemispheres.

IX. Circles: (*a*) *Great Circles* divide the earth into two equal parts.

1. The *equator* is a great circle.
2. *Two meridians* opposite each other form a great circle. This is also known as a meridian circle.

(*b*) *Small Circles* divide the earth into unequal parts.

Parallels of Latitude are small circles.
The Earth's Orbit is in form an ellipse.
The Plane of the Ecliptic is the space bounded by the earth's orbit.
The Earth's Axis inclines 23½ degrees towards this plane.

The inclination of the earth on its axis causes the rays of the sun to fall within 23½° of the poles or to extend 23½° beyond the poles.

By the earth turning on its axis, small circles are formed which mark these limits of the sun's light. They are called

(*a*) *Arctic Circle* in Northern Hemisphere.
(*b*) *Antarctic Circle* in Southern Hemisphere.

The small circles 23½ degrees north and south of the equator mark the turning point of the sun's vertical rays.

When the earth revolves about the sun, the inclination of the earth on its axis causes part of the equator to be above and part below the plane of the ecliptic. The vertical rays of the sun are directly at the plane; therefore, as the earth inclines 23½ degrees, the limit of these direct or vertical rays will be this distance each side of the equator. These limits or turning points are called *The Tropics.*

(*a*) Tropic of Cancer in Northern Hemisphere.
(*b*) Tropic of Capricorn in Southern Hemisphere.

As the vertical rays of the sun affect a smaller portion of the earth's surface than the slanting rays, that portion of the earth, where the vertical rays are, is the warmest.

X. Zones: The different parts of the earth's surface set off by the Arctic and Antarctic Circles and the Tropics.

There are five—

(*a*) *North Frigid,* north of Arctic Circle, 47 degrees wide. It has the North Pole in the center. Very cold. Days and nights vary from 24 hours to 6 months. Two seasons. But little known.

(*b*) *North Temperate,* between Arctic Circle and Tropic of Cancer, 43 degrees wide. Best known part of the earth. Temperature varied. Four seasons.

(*c*) *Torrid,* between the Tropics. 47 degrees wide. The equator divides it equally. Hottest portion of the earth. Days and nights are nearly of equal length. Has two seasons, wet and dry.

(*d*) *South Temperate,* between the Tropic of Capricorn and the Antarctic Circle. 43 degrees wide. Seasons opposite to those in the North Temperate Zone. Has four seasons.

(*e*) *South Frigid,* south of Antarctic Circle. 47 degrees wide. Has South Pole in center. Days similar in length to North Frigid Zone, but at opposite seasons.

Three of these zones are like belts and two like caps. The Temperate Zones contain over half of the land surface of the earth.

XI. Latitude: Is the distance north or south of the equator. The greatest latitude a place can have is 90°. This is at the poles. There is no latitude at the equator.

XII. Longitude: Is the distance east or west of a meridian known as the *Prime Meridian.* The Prime Meridian generally used is that of *Greenwich, England.* A place of this meridian has no longitude.

A place on this meridian and on the equator has neither latitude nor longitude.

The greatest longitude a place can have is 180°.

The earth makes a complete rotation every 24 hours. Fifteen degrees of longitude are presented to the sun every hour. Places fifteen degrees apart have an hour's difference in time.

Places east of the Prime Meridian see the sun before those that are on the meridian. For every 15° east they see it an hour earlier. Places that are west see it after they do at the Prime Meridian. Every fifteen degrees makes an hour later.

Persons traveling 180° west would see the sun twelve hours after they would see it at Greenwich. Persons traveling 180° east would see it twelve hours before they would see it at Greenwich.

When these persons meet at the 180th meridian from the place of starting, they will find when they compare reckoning of time that it differs in a great degree. The one who has gone in an easterly direction will find that his time is twelve hours later than when he started. The one who went in a westerly direction will find that his is twelve hours earlier than when he started. Suppose that it was New Year's Day at noon when they started, the one who went east would find that by his reckoning it was twelve midnight of January first; the one who went west would find by his reckoning it was twelve midnight of December thirty-first—yet they are together at the 180th meridian from where they started.

To overcome this difficulty an *International Date Line,* at the 180 meridian east and west of Greenwich, has been agreed upon by the nations as the place where time is changed.

The person traveling west crossing this line on *Sunday* would by this agreement call it *Monday.* The person traveling east crossing the line *Sunday* would call it *Saturday,* at the same hour of day.

This line does not exactly follow the 180 meridian, but avoids land bodies as much as possible and thus becomes irregular.

XIII. Day and Night: The earth, while turning on its axis, presents different parts to the sun. The part in the sun light is said to have day. The part without sun light is said to have night.

As the earth inclines towards the plane of the ecliptic as it revolves about the sun, the different parts of the earth vary in the length of time that they are in the sun light. At the equator the days and nights are equal, while at the poles a day is six months long and the night the same length.

From March 21st to September 21st, the North Pole is in the sun light and the South Pole is out of it; while from September 21st to March 21st, the South Pole is in the sun light and the North Pole out of it; therefore, that part which is in the sun light is having six months day.

The length of the longest day in the latitude of New York is 15 hours, while the length of the shortest day in the same latitude is about 9¼ hours.

When the days are the longest in one hemisphere, the nights are the longest in the other.

XIV. The Seasons: *Caused by*

1. Revolution of earth about the sun.
2. Inclination of earth's axis.
3. Varying length of day and night.

The seasons may be

- (*a*) Wet or dry, as in Torrid Zone.
- (*b*) Summer or winter, as in Frigid Zone.
- (*c*) Spring, summer, autumn and winter, as in Temperate Zones.
- (*d*) Modifications of each, as you pass from one zone to the other.

XV. Standard Time: The time within certain districts or belts, used for convenience by railroads, etc.

The time of each district is the solar time of meridians 15° apart.

The Districts are knows as—

Colonial—Solar time of 60 meridian W. L. 4 hours earlier than Greenwich.
Eastern— " " " 75 " " 5 " "
Central— " " " 90 " " 6 " "
Mountain— " " " 105 " " 7 " "
Pacific— " " " 120 " " 8 " "

As the railroads change the time of running only at important stations or junctions, the lines of division of the districts are irregular.

The boundary between the Colonial and Eastern—

From the St. Lawrence River near 65 meridian, west longitude, irregularly to the Atlantic Coast of Maine, near the 68 meridian west longitude.

The boundary between the Eastern and Central Districts—

From Fort William on the Canadian side of Lake Superior, it follows the Canadian lake shore line to Buffalo; thence in an irregularly southeasterly direction to near Gainesville, Georgia; thence southeasterly to the coast at Savannah, Georgia.

The boundary between the Central and Mountain Districts—

From a point on the northern boundary of the United States near the 103 meridian west longitude, southeasterly to a place in Nebraska, near Long Pine; thence westerly to Alliance, Nebraska; thence irregularly in a southwesterly and southeasterly direction to Cheyenne; thence easterly to the Arkansas River; thence southwesterly to the boundary of the United States and Mexico near El Paso.

The boundary between the Mountain and Pacific Districts—

From a point on the boundary of the United States and Canada, just east of the 117 meridian west longitude, in a generally southwesterly direction to a place just east of the 120 meridian west longitude, south of the 40° parallel north latitude; thence in a south-easterly direction to a point near El Paso—on the boundary of the United States and Mexico.

XVI. **Solar Time:** Is the actual time of a place. It differs as places are east or west of a meridian from which time is reckoned.

THE ATMOSPHERE.

I. **Consists of:** (*a*) a gas called *nitrogen* which is necessary to form the structure of animals and plants.

(*b*) a gas called *oxygen* which animals breathe and without which they would die.
(*c*) a gas known as *carbon dioxide* which plants breathe.
(*d*) vapor.
  1. Visible.
  2. Invisible.
(*e*) dust particles.

II. **Uses:** (*a*) The Atmosphere acts as a *screen* to keep the excessive heat of the sun from the earth.

(*b*) It acts as a *blanket* to prevent the too rapid radiation of the earth's heat.
(*c*) It is a *carrier* of water from ocean to land.
(*d*) It is *necessary to the life* and progress of man, for without it nothing could live.

II. **Its Temperature** is its condition as to being hot or cold.

It varies—

(*a*) with the latitude. Near the equator warmer than at the poles.
(*b*) with the altitude. At sea level it is warmer than at the top of a mountain. The temperature is 1° colder for every three hundred feet of ascent.

. **Vapor:** Water that has passed from a visible to an invisible form. It assumes this form by a process called *evaporation.*

Evaporation is increased by—

(*a*) High temperature.
(*b*) Dry condition of the atmosphere.
(*c*) Lessening of pressure.
(*d*) Wind.

It is greatest—

1. Within the Tropics.
2. On top of high mountains.
3. In warm and dry atmosphere.
4. When wind removes the air filled with vapor and fresh air takes its place.

The amount of vapor one cubic foot of atmosphere will hold at

Degrees F.		Grains.	Degrees F.		Grains.
0	is	.56	60	is	5.75
40	is	2.85	70	is	7.98
50	is	4.08	80	is	10.94

While there may be less there cannot be more than this amount and the point at which the moisture is changed to water or snow is called the

Point of Saturation or Dew Point.

II. Dew: Vapor condensed during a still, clear night, and deposited in the form of drops of water on leaves, grass, rocks, etc.

Cause—When a night is clear and there is no wind, the leaves, grass, etc., as well as the surrounding air, throw off their heat. The ground cools more rapidly than the air. The layer of air nearest to the ground cooling more rapidly than that above, it soon reaches the Dew Point. As it cannot retain as much moisture as it did before, its vapor is condensed and deposited as dew.

Some objects radiate or throw off heat more rapidly than others; in such cases there will be

(*a*) more rapid cooling of surrounding atmosphere.
(*b*) less ability of the atmosphere to hold moisture.
(*c*) greater deposit of dew.

In California, Arizona and Arabia the amount of dew is so great that it becomes an important aid in the growth of plants.

III. Frost: When the temperature of the dew-point is below 32° Fahrenheit, then we have frost. Fog and dew help to retard freezing temperature by retaining the heat in objects near the earth which they cover.

IV. Clouds: The invisible vapor of the atmosphere assuming a visible appearance, yet sufficiently light to float above the earth.

(*a*) *Cause*—Two or more currents of air of different temperatures coming in contact cause a condensation of vapor. The vapor thus condensed, with the little dust particles that are floating in the atmosphere, form clouds.

(*b*) *Uses.*—They
  (1) Serve as water carriers.
  (2) *a* With the dust particles of the atmosphere screen the earth from the excessive heat of the sun.
    b Check too rapid radiation of heat from the earth.

(*c*) *Kinds*—
  1. *Cirrus*—light, feathery—lightest kind; attains highest elevations.
  2. *Cumulus*—heaped up—grandest in appearance—lightning clouds.
  3. *Stratus*—in layers or ribbon-like—evening clouds.
  4. *Nimbus*—storm clouds.
  5. *Cirro-Cumulus*—mackerel sky.
  6. *Cirro-Stratus*—layers of light, feathery clouds—seen before storms.
  7. *Cumulo-Stratus*—heaped-up clouds resting on layer clouds.

(*d*) *Carries*—
  Very small floating particles which cool more rapidly than the vapor and aid condensation.

V. **Fog:** Is the same as clouds only it is nearer the earth.

In the North Atlantic Ocean where the warm air of the Gulf Stream meets the cool air from the Arctic Current is found the greatest amount of fog. This is off the Grand Banks of Newfoundland.

VI. **Mist:** Is vapor descending in minute drops.

VII. **Rain:** Vapor condensed and falling to the ground in drops on account of its weight.

1. *Cause*—The atmosphere cooling retains less vapor, therefore, this vapor is condensed and precipitated to the earth.
2. *Uses*—
   - (*a*) Washes the atmosphere and surface of the earth.
   - (*b*) Is necessary to all animal and vegetable life.
3. *The amount of rain fall is greatest*—
   - (*a*) as we ascend slopes.
   - (*b*) Where warm moist winds blow on mountains.

   The greatest amount of rain falls
   - (*a*) In the Tropics, where the sun is near its zenith.
   - (*b*) In the Warm Temperature Belt—in winter.
   - (*c*) 35° to 40° from the equator—in spring and autumn.
4. *The least rain falls in*
   - (*a*) Sahara.
   - (*b*) Arabia.
   - (*c*) Northwestern India.
   - (*d*) Gobi
   - (*e*) Australia.
   - (*f*) Southern Africa.
   - (*g*) Western slope of Andes, northern Chili and Peru.
5. *Rainfall may be*
   - (*a*) constant, about equator, a belt of 5° wide.
   - (*b*) periodic, to north and south of the constant belt.
   - (*c*) variable, beyond the periodic belt.

VIII. **Snow:** The vapor of the air frozen before falling. It is rarely found nearer the equator than 30°, except about three miles above sea level.

The line above which there is perpetual snow is the snow line.

Uses—
- (*a*) Protects the surface of the earth from severe cold.
- (*b*) Acts as feeders to rivers.

IX. **Wind:** Air in motion.

(*a*) MOVEMENTS OF AIR—

1. *Vertical-Currents*—Caused by unequal distribution of heat, volume determined by size of area heated.

   Rapidity of movement determined by the amount of difference in temperature.
2. *Horizontal*—Wind.

(*b*) CIRCULATION OF AIR—

When warm air filled with vapor at the Tropics rises, cooler and dryer air from both north and south rushes in to take the place of this air. This air spreads out and passes away from the Tropics as an upper current. Thus a circulation is produced.

This circulation is modified by
1. the earth's movements
2. the land bodies on its surface.

THE UNITED STATES WEATHER BUREAU designates wind as
Light when air travels from 1 to 9 miles per hour.
Fresh " " " " 10 " 19 " " "
Brisk " " " " 20 " 29 " " "
High " " " " 30 " 39 " " "
Gale, air traveling 40 to 59 miles per hour.
Hurricane, air traveling 60 or more miles per hour.

Winds according to regularity of direction from which they blow are

1. *Steady,* when they constantly blow from one direction—trade winds.
2. *Periodical,* when they blow for a period from one direction and then change to the opposite—monsoons—land breezes.
3. *Variable,* when they blow for a short, irregular period from one direction then change to another.

(*c*) USES OF WIND—It

1. Changes temperature by carrying heat.
2. Modifies climate by carrying water.
3. Becomes a power to work for or against man.
4. Purifies air.

(*d*) WIND BELTS—

1. *Equatorial calm*—near equator; no wind, but currents.
2. *Northeast trade* and *southeast trade*—lower winds.
   Anti-N. E. trade and *Anti-S. E. trade*—upper winds.
3. *Tropical calm, or Horse latitudes*—near the tropics of cancer and capricorn—currents, but little wind.
4. *Equatorial westerlies*—lower winds.
   Polar—upper winds.

(*e*) LOCAL NAMES GIVEN TO WINDS:

The *warm southerly* winds from the African coast of the Mediterranean Sea are called—

1. *Simon.* 2. *Sirocco.* 3. *Solano.*

The *blizzard* of the United States is similar to the

1. *Bora* of the Adriatic Sea.
2. *Gregale* of Malta.
3. *Purga* of Siberia.

The *mistral of Southern France* is like the northwest wind that follows a storm center over the lake region of North America.

The dry Puna winds of Peru are like the so-called hot winds of Missouri and Nebraska.

X. **Storms:** Violent atmospheric disturbances.

They may be caused by—

(*a*) *Wind,* producing

1. Windstorm.
2. Sandstorm.
3. Tornado.
4. Typhoon.
5. Hurricane.

(*b*) *Precipitation,* producing
- 1. Rainstorm.
- 2. Hailstorm.
- 3. Snowstorm.
- 4. Monsoon.
- 5. Cloudburst.
- 6. Flood.

(*c*) *Electricity* where
- 1. Thunder is impressive.
- 2. Lightning destructive.

(*d*) *Blizzard*—Characteristics:
- 1. Snow.
- 2. Cold wind.

Storms may be classified as—
- (*a*) Cyclonic—low pressure.
- (*b*) Anti-Cyclonic—high pressure.

Storms occur with most frequency between parallels 45° and 55° north latitude.

Weather Bureau: The United States Government for the benefit of its people has established a bureau that
1. Forecasts the weather for 36 hours.
2. Forecasts severe storms and cold weather.
3. Warns shipping of impending storm.

This Bureau has adopted a series of *Flag Storm Warnings*—
1. Red flag, black center—storm of marked violence.
2. Pennant displayed with this flag indicates direction of wind.
    - (*a*) Red—easterly (N. E. to S.).
    - (*b*) White—westerly (S. W. to N.).
3. Pennant above flag—wind from northerly quarter.
4. Pennant below flag—wind from southerly quarter.
5. Red light at night—easterly wind.
6. White light above red at night—westerly wind.
7. Two red flags, black centers, displayed one above the other—a hurricane or dangerous storm.

No night signals of hurricanes are displayed.

It has also a system of signals by which it forecasts the state of the weather.
- (*a*) *White Flag*—clear or fair.
- (*b*) *Blue Flag*—rain or snow.
- (*c*) *Flag, upper half white, lower half blue*—local rain or snow.
- (*d*) *Flag, white, black center*—cold wave.
- (*e*) *Flag, black triangle*—temperature.

WATER.

I. **It acts as a covering** to the greater part of the earth's surface.

II. **Water**
- (*a*) *is necessary to life.*
- (*b*) *is the chief means by which animals and plants are nourished.*
- (*c*) *gives form to animals and plants.*
- (*d*) *may become by change of temperature*
    - 1. *Solid,* ice. 2. *Liquid,* water. 3. *Gas,* vapor or steam.
- (*e*) *effects changes in the forms and conditions of the land.*

III. Water COLLECTS. The names given to bodies of water that collect indicate their size.

1. Ocean—Largest body of water.
    - (*a*) *Sea*—Branch or part of an ocean.
    - (*b*) *Gulf or bay*—That part of the ocean that indents the land less deeply than the sea.
2. Lake is a body of water smaller than an ocean. It may have:
    - I. *An inlet,* water flowing in.
    - II. *An outlet,* water flowing out.
    - III. *No apparent inlet or outlet,* but be fed from hidden springs or melting snow from the mountain sides.

IV. Water Flows. Flowing water is called a stream. The largest stream is is called a *river.* Smaller streams are known as *brooks, creeks, rivulets, rills.*

Straits connect two bodies of water and separate two bodies of land.

Sounds are wide straits.

THE OCEAN.

The great mass of water that covers three-fourths of the surface of the earth.

(a) Names: It is known as

1. *Pacific*—That part between the Arctic and Antarctic circles, west of the Americas and east of Eurasia.
    - (*a*) It is the largest and comprises about one-half of the water surface of the earth.
    - (*b*) It is the most quiet.
2. *Atlantic*—That part between the Arctic and Antarctic circles, east of the Americas and west of Eurasia and Africa.
    - (*a*) It is about half the size of the Pacific Ocean.
    - (*b*) It is the most stormy.
    - (*c*) It is the most important to us as a highway of travel.
    - (*d*) It has the best harbors on the coasts, caused by its numerous arms or branches.
3. *Indian*—That part south of Eurasia, east of Africa and west of Oceanica.
4. *Arctic*—North of Arctic circle, but it is really a branch or arm of the Atlantic Ocean.
    - (*a*) It is about seven-eighths the size of the Atlantic Ocean.
    - (*b*) It is very cold and is filled with ice, which makes navigation almost impossible.
5. *Antarctic*—There are no land masses in the Southern Hemisphere near this ocean, therefore there are no well-defined boundaries other than the Antarctic circle. The Arctic and Antarctic oceans are the coldest.

(b) Uses:

1. Supplies the air with moisture.
2. Modifies climate.
3. Produces winds.

4. Affords highways of travel.
5. Changes coast lines by wearing them away or adding to them.

(c) **The Ocean Varies in Depth:** Its bed is like the surface of the land with hills and valleys, with stretches of plateaus, but much more uniform. The greatest depth (about five miles) is in the Pacific Ocean. The average depth of the Atlantic Ocean is three and one-half miles.

(d) **Movements:**

1. WAVES.

The upward and downward movement of the ocean. They are caused by the wind.

The *crest* is the top of a wave.

The *trough* is the low part of water between two crests.

Waves only affect the surface of the ocean. They move forward at a varying rate from fifteen to forty miles an hour.

Waves build up as well as tear away land.

2. TIDES: The alternate rising and falling of the ocean, which occurs about every six hours.

(*a*) *Cause—*
1. The attraction of the waters by the sun.
2. The attraction of the waters by the moon.

As the sun is nearly 400 times further away than the moon its power is materially less. When the moon is opposite any portion of the ocean it attracts or pulls the water at this point towards it. This causes the tide to become high. At the same time that it attracts the water, it also attracts the earth that is directly under the water that has been attracted. This in turn is pulled away from the water that is over it on the opposite side of the earth, causing the water to flow in or pile up, and there is a high tide directly opposite the place where there is the other high tide.

Half-way between these two places the water, having been pulled away by the moon's power of attraction, has caused low tides opposite to each other. High tide occurs at a place where the moon is near the meridian of that place. At full and new moon the tides are the greatest. This is caused by the combined power of sun and moon.

(*b*) *Tides are—*
1. Flood, or high.
2. Ebb, or low.
3. Spring, when the flood tide is highest.
4. Neap, when the flood tide is lowest.

While waves chiefly affect the surface of the water, tides exert an influence upon the whole body of water.

(*c*) *Tidal Waves* are supposed to begin near the Antarctic Circle. Their general course is northwest. The narrowness of the Atlantic Ocean affects the direction north of the equator. On account of the land the tidal waves are deflected in a northeasterly direction.

Tides vary in height. In mid-ocean they are from one to two feet high, while at the Bay of Fundy they are from fifty to sixty feet. The character of the coast affects the height of the tide.

A wide-mouthed indentation will cause a high tide at its head—for example, the Bay of Fundy.

A narrow opening produces little or no tide—for example, Mediterranean Sea.

3. CURRENTS:

Great rivers of water flowing through the ocean.

Causes—

(*a*) Rotation of the earth on its axis.
(*b*) Winds.
(*c*) The unequal heating of the water.

As cold water is heavier than warm, it sinks, and the warmer water rises. Therefore, in the ocean there are surface currents and under currents flowing in opposite directions. The warm waters of the equatorial regions flow towards the poles, while the cold water from the polar regions flow towards the equator. Where the streams come in contact the warmer flows over the colder.

The equatorial currents originate about the equator and flow from east to west, then divide into northern and southern branches. When they reach the ocean's western boundary their course is deflected to the east, when again they are divided into two branches, one flowing in the direction of the equator, the other towards the poles. The current from the northern polar regions flows along the eastern coast of countries bordering on the ocean, while the current from the southern polar regions flows along the western coast of countries that border on the ocean.

The Gulf Stream.

It begins at the Caribbean Sea, and develops into a definite current at Florida Strait. Thence it passes in a north-easterly direction. Part of its waters makes a circuit and returns to the equatorial current. Part reaches the western coast of Europe.

It is the warmest ocean current. In some parts its temperature is 20° F. higher than that of the neighboring waters.

It moves more rapidly than any other current, although its movement is not uniform. The average speed of its waters at Florida Strait is about four miles an hour, while off the coast of Newfoundland it hardly has any motion of its own.

The Japan or Kuro Sievo is the Gulf Stream of the Pacific Ocean.

Beginning near the Bay of Bengal it flows along the eastern coast of Asia until it reaches Japan, where its motion seems to be lost, and it is pushed by winds in a northeasterly direction towards the American coast.

Sargasso Seas: Calm bodies of water surrounded by equatorial currents or their branches. Sometimes called *grassy seas* on account of grass found there.

RIVERS.

Streams of water flowing through the land.

I. Parts:

(*a*) *Source*—where it begins.
(*b*) *Course*—general direction in which it flows.
(*c*) *Mouth*—where its waters flow into some other body of water. If there are two or more mouths they form a *delta*.
(*d*) *Bed*—land over which it flows.
(*e*) *Channel*—the deepest and swiftest part of the river.
(*f*) *Current*—where it flows most rapidly.
(*g*) *Banks*—land on each side of a river, as you go towards its mouth—right—left.
(*h*) *Cataract*—when a river descends from a higher to a lower level.
  1. *Rapids*—if the descent is gradual.
  2. *Waterfalls*—the descent is nearly perpendicular.
(*i*) *River System*—a river and its branches.
(*j*) *River Valley or Basin*—the country drained by a river system.

II. Uses:

(*a*) drain land.
(*b*) water land.
(*c*) highway of travel and commerce.
(*d*) modifies climate.
(*e*) increase fertility of soil.
(*f*) develop power for manufacture.

LAND.

Is the visible portion of the earth's surface.

It is made up of
(*a*) rocks.
(*b*) stones.
(*c*) gravel or sand.
(*d*) dirt.
(*e*) soil made up of worn out animal and vegetable matter.

I. Coast: Where the ocean or sea ends. In speaking of the end of the land it is called the shore.

The coast may be
(*a*) regular.
(*b*) irregular or indented.
(*c*) reefy.
  1. barrier.
  2. fringing.

Indented coasts usually have good harbors, and the people living in these countries where they are, become progressive in every respect.

II. May be Called:

- (*a*) *Continents*—large bodies of land.
- (*b*) *Islands*—land surrounded by water.
    1. *Continental*—those near continents. Tops of submerged mountains.
    2. *Coral*—made by coral polyph.
- (*c*) *Peninsulas*—land almost surrounded by water.
- (*d*) *Capes*—land projecting into the water.
- (*e*) *Promontories*—high capes.
- (*f*) *Isthmuses*—land connecting two bodies of land.

III. The Surface of the Land Consists of highlands and lowlands. Highlands that part of the earth's surface that is more than two thousand feet above sea level.

Lowlands are that part of the earth's surface less than two thousand feet above sea level.

- (*a*) *Plains*—comparatively level tracts of land, but little elevated above the sea level—they may be:
    1. *grassy*—prairie, pampas, llanos, steppes, savannahs, meadows, heath, moor.
    2. *wooded*—selvas.
    3. *desert*—barren wastes. Fertile spots in deserts are called *oasis*.
- (*b*) *Plateaus* are elevated plains.
- (*c*) *Hill*—land piled up.
- (*d*) *Mountain*—the land over five hundred feet high, which has either been pushed up or folded. It is wrinkled in aspect.
    1. *ridge*—when it is worn away.
    2. *range*—many ridges extending in the same direction.
    3. *chain*—many ranges extending in same general direction.
    4. *system*—many chains of mountains, separate and distinct from others.
    5. *peak*—a mountain higher than the rest.
    6. *valley*—the land between two mountains. If the valley crosses a mountain range it is called a canon, gap or pass.
- (*e*) *Volcano*—an opening in the ground from which comes steam, smoke fire, ashes and melted stone, or lava. This forms a mountain about the opening. The opening is called the crater.

AVALANCHE.

Is snow which, loosened by warmth, plunges down the mountains with great velocity.

Glaciers: Rivers of ice.

- (*a*) Formed in mountain valleys
    1. By snow above the snow line pressing upon the snow below the snow line.
    2. By heat of the sun causing, with the pressure, the snow to melt and become ice.

(*b*) Glaciers are of two kinds:
First Rank—Those that reach the lower valleys and become streams of water.
Second Rank—Those that do not.

(*c*) *Movements depend upon*
(*a*) slope of glacier's bed, more rapid if steep.
(*b*) season of year—greatest in summer.

Moves faster
1. during the day.
2. when large and deep.
3. in the middle than at the sides.
4. at the surface than at its bottom or bed.

Cause—The pressure of the snow and ice from higher altitudes is constantly forcing the glacier to lower levels.

(*d*) *Crevasses* are deep cracks in a glacier.

(*e*) *Moraines*—rocks and debris carried on its surface and pushed by its sides and bottom.

An *Iceberg* is the lower part of a glacier broken off and floating away from it in the ocean. Only one-eighth of the mass is visible, the other seven-eighths being submerged.

EARTHQUAKES.

Supposed Cause: A disturbance under the surface of the earth which causes it to change its form.

Results: tidal waves.
destruction of life and property.
change of physical aspect.

Location: The principal localities affected by earthquakes in the past have been:
(*a*) Asia Minor.
(*b*) Southern Italy and adjacent islands.
(*c*) Spain.
(*d*) Japan.
(*e*) China.
(*f*) Philippine Islands.
(*g*) Egypt.
(*h*) Algeria.
(*i*) Northern and Northwestern part of South America.
(*j*) West Indies.
(*k*) Hawaii.
(*l*) California.
(*m*) South Carolina (very slight).

CLIMATE.

The conditions of the weather as regards heat and moisture.

Weather changes rapidly. Climate changes slowly.

Climate:

1. Affects animal and vegetable life.
2. Promotes or retards navigation.
3. Aids in developing the earth as a home for man.

Climate is Modified by—

1. Distance from equator, the temperature falling as we leave the equator.
2. Distance from the ocean.
3. Height above sea-level. For every 300 feet of height there is a decrease in temperature of about 1° Fahrenheit.
4. Winds and ocean currents.

Climate is Called:

1. *Maritime,* near ocean. Water changes its temperature more slowly than land, because it is free from extremes of heat and cold.
2. *Continental, or Insular*—Away from the ocean. Being away from the modifying influences of water, extremes of heat and cold are greater.

Isotherms: Are lines of equal heat.

Isotherms may mark zones of temperature—

(*a*) Torrid zone, bounded by 70° F.
(*b*) Temperate zone, bounded by 70° F. and 32° F.
(*c*) Frigid zone, where temperature is below the isotherm of 32° F.

The *Thermal Equator* is the line of greatest equal average heat, 82° F. It crosses the northern part of Brazil; extends northwest to about 23° north latitude, in the Gulf of California; takes a southerly direction below the equator; westerly passing north of New Guinea; northwest until it reaches Hindoostan; then north to 23° parallel north latitude; turns south and west across Africa at 15° parallel north latitude; then southwest across the Atlantic to Brazil. This is the mean or average location. When the sun is in the Northern Hemisphere it extends further north and when in the Southern Hemisphere further south.

Effects of Climate: In the Torrid Zone the hot moist air with frequent rainfalls promotes rapid and luxuriant growth of vegetation. Add to this a temperature for the whole year that allows plant growth, it is readily seen why here there is the greatest amount of plant life. The atmosphere of this zone seems to invite intensity of color.

Wild animals are here found in greater abundance than in any other part of the world. The variety of birds and the brilliancy of their plumage is greater than elsewhere.

The conditions that promote animal and plant life have just the opposite effect upon man. Nature provides for him food without any effort on his part, the temperature is such that he needs no substantial houses and but little clothing to protect him from its effects, and the heat prevents him from working as is done elsewhere. For these reasons he is less energetic, accepts conditions as they are, and, in fact, is not progressive in any respect.

The Temperate Zone with its four seasons and in some parts extremes of temperature provides conditions for plant growth, which, to a great extent, gives to the world the greatest amount of breadstuffs and useful plants.

The domestic animals, with man's care, here do their best, and the conditions of climate add to their value.

With man the climatic obstacles that he has to overcome bring out the best there is in him. He is active, energetic and progressive.

The cold of the Frigid Zone prevents growth of all kinds. Only on the borders of the Temperate Zone do we find vegetation that amounts to anything.

Here fur-bearing animals are found. Their furs are the most valuable product of this section.

Man, as well as plant life, is dwarfed physically and mentally. His opportunity to work is limited, and he desires but little.

FORESTS.

Large tracts of land covered with trees.

Uses:
1. Supply wood for manufacturing purposes and fuel.
2. Protect land from the effects of the wind.
3. Aid in storing moisture.
4. Check evaporation.

Owing to the reckless destruction of forests by man, their need is being felt. The United States government has set apart certain tracts which are not to be sold or allowed to be settled. These wooded tracts cover about 50,000,000 acres.

They are principally located in

1. Arkansas.
2. California.
3. Arizona.
4. Montana.
5. Colorado.
6. New Mexico.
7. Washington.

The several State governments are creating in their respective States forest reservations. The State of New York has a reservation in the Adirondacks of over 1,000,000 acres.

UNITED STATES.

The United States Comprises:

(*a*) Forty-eight States.
(*b*) Two Territories.
(*c*) The District of Columbia.
(*d*) The Panama Canal Zone.
(*e*) The dependencies or colonial possessions are Porto Rico and a few small islands near it; Guam; Tutuila; the Philippine Islands which number over 2,400, but only about eleven of which are of any importance.

(a) Location: *The main part of the United States* is in the central part of North America, N. L., 25° to 49°; W. L., 67° to 125°.

Boundaries: North, Canada, St. Lawrence River and Great Lakes, except Lake Michigan; east, Atlantic Ocean; south, Atlantic Ocean, Gulf of Mexico, Mexico and Rio Grande River; west, Pacific Ocean.

I. *The territory of Alaska* is in the extreme northwestern part of North America. N. L., 55° to 72°; W. L., 130° to E. L. 172°. Boundaries: North, Arctic Ocean; east, Dominion of Canada; south, Pacific Ocean; west, Pacific and Arctic Oceans.

II. *The territory of Hawaii,* surrounded by the Pacific Ocean, is in about the same latitude as Cuba. N. L., 19° 15′ to 22° 15′. W. L., 155° to 160°.

III. *Panama Canal Zone* is in the extreme southern part of North America.

IV. (*a*) *Porto Rico* is in the *Greater Antilles,* a part of the *West Indies.*
(*b*) *Guam*—In Pacific Ocean. N. L., 13° 30′. E. L., 144° 45′.
(*c*) *Tutuila*—In Pacific Ocean. S. L., 14°. W. L., 170°.
(*d*) *Philippine Islands*—In the Pacific Ocean, southeast of Asia. N. L., 4° 40′ to 21° 10′. E. L., 117° to 126° 34′.

(b) Its Indenting Waters are: On the east coast—

(*a*) *Massachusetts Bay.*
(*b*) *New York Bay.*
(*c*) *Delaware Bay.*
(*d*) *Chesapeake Bay.*
(*e*) *Albemarle and Pamlico Sounds.*
(*f*) *Mobile Bay.*
(*g*) *Galveston Bay.*

On the west coast—(*a*) *San Francisco Bay.* (*b*) *Puget Sound.*

(c) Projecting Points: On the east coast—

(*a*) *Cape Cod.*
(*b*) *Sandy Hook.*
(*c*) *Cape May.*
(*d*) *Cape Charles.*
(*e*) *Cape Henry.*
(*f*) *Cape Hatteras.*
(*g*) *Cape Lookout.*
(*h*) *Cape Sable.*

On the west coast—

(*a*) *Cape Flattery.* (*b*) *Cape Mendicino.* (*c*) *Point Conception.*

(d) Islands off the Coast: East—

1. *Long.*
2. *Bermudas.*
3. *Bahamas.*
4. *West Indies.*

West—*Santa Barbara.*

THE STATES ARE DIVIDED INTO GROUPS BY THE UNITED STATES GOVERNMENT, AS FOLLOWS:

I. North Atlantic:

State—	Capital—	Commercial Centre—
Maine,	Augusta,	Portland.
New Hampshire,	Concord,	Manchester.
Vermont,	Montpelier,	Burlington.
Massachusetts,	Boston,	Boston.
Rhode Island,	Providence,	Providence.
Connecticut,	Hartford,	New Haven.
New York,	Albany,	New York.
New Jersey,	Trenton,	Newark.
Pennsylvania,	Harrisburg,	Philadelphia.

II. South Atlantic:

State—	Capital—	Commercial Centre—
Delaware,	Dover,	Wilmington.
Maryland,	Annapolis,	Baltimore.
Dist. Columbia,	Washington, *Capital of United States.*	
Virginia,	Richmond,	Richmond.
West Virginia,	Charleston,	Wheeling.
North Carolina,	Raleigh,	Charlotte
South Carolina,	Columbia,	Charleston.
Georgia,	Atlanta,	Atlanta.
Florida,	Tallahassee,	Jacksonville.

III. South Central:

State—	Capital—	Commercial Centre—
Kentucky,	Frankfort,	Louisville.
Tennessee,	Nashville,	Memphis.
Alabama,	Montgomery,	Birmingham
Mississippi,	Jackson,	Meridian
Louisiana,	Baton Rouge,	New Orleans.
Texas,	Austin,	San Antonio
Arkansas,	Little Rock,	Little Rock.
Oklahoma,	Oklahoma City,	Oklahoma City.

IV. North Central:

State—	Capital—	Commercial Centre—
Ohio,	Columbus,	Cleveland and Cincinnati.
Indiana,	Indianapolis,	Indianapolis.
Illinois,	Springfield,	Chicago.
Michigan,	Lansing,	Detroit.
Wisconsin,	Madison,	Milwaukee.
Minnesota,	St. Paul,	Minneapolis.
Iowa,	Des Moines,	Des Moines.
Missouri,	Jefferson City,	St. Louis.
North Dakota,	Bismarck,	Fargo.

IV. North Central: Continued.

State—	Capital—	Commercial Centre—
South Dakota,	Pierre,	Sioux Falls.
Nebraska,	Lincoln,	Omaha.
Kansas,	Topeka,	Kansas City.

V. Western:

State—	Capital—	Commercial Centre—
Montana,	Helena,	Butte.
Wyoming,	Cheyenne,	Cheyenne.
Colorado,	Denver,	Denver.
New Mexico,	Santa Fe,	Albuquerque.
Arizona,	Phœnix,	Tucson.
Utah,	Salt Lake City,	Salt Lake City.
Nevada,	Carson City,	Reno.
Idaho,	Boise,	Boise.
Washington,	Olympia,	Seattle.
Oregon,	Salem,	Portland.
California,	Sacramento,	San Francisco.

The Territories are:

	Capital—	Chief City—
Alaska,	Juneau,	Juneau
Hawaii,	Honolulu,	Honolulu.

The center of the United States from the extreme eastern place in Maine—Eastport—to the most western of the Aleutian Islands, is about two hundred and fifty miles west of San Francisco, in the Pacific Ocean.

Kansas is about half-way between the northern boundary of North Dakota, 49th parallel north latitude, and the southern boundary of Texas, 26th parallel north latitude.

(e) **Area:** United States and its dependencies, about 3,768,743 square miles.

(f) **Surface:** From east to west the United States proper is marked by well defined limits, as follows:

I. ATLANTIC SLOPE, narrow in the north, widening to between two and three hundred miles in the south. It is the widest south of the 41st parallel North Latitude. It has:

1. *Short, swift, tidal rivers.*
2. *Good harbors.*
3. *Fertile land.*
4. *Large population.*
5. *Great commercial activity.*
6. *Great wealth.*

II. ATLANTIC HIGHLANDS, or APPALACHIAN MOUNTAIN SYSTEM, a great iron, coal and oil region, extends from *Maine* to *Alabama.*

III. THE GREAT CENTRAL PLAIN: Extends from the Atlantic to the Pacific Highlands. Its surface consists of low, fertile plains in the east, separated from the higher plains in the west by the Mississippi River. From this river westward the land rises until it reaches an altitude of 2,000 feet.

It has—(*a*) *long, large, slow-flowing rivers;* (*b*) *fertile plains;* (*c*) *large tracts of pasture land;* (*d*) *large systems of irrigation which, by providing water, have made barren land fertile.*

It is the great agricultural section which provides a considerable part of the *breadstuffs, cattle* and *articles of clothing* for our own use, as well as for export.

It may be divided from north to south—

(*a*) Lake slope; (*b*) Central plain; (*c*) Gulf slope.

IV. Pacific Highlands include—

(*a*) *Rocky Mountains.* (*c*) *Great Basin.*
(*b*) *Great Plateau.* (*d*) *Cascade and Sierra Nevada Mountains.*

A large body of salt water is found in the great basin known as the Great Salt Lake; besides this there are numerous smaller bodies of salt water. They are caused by the lakes having no apparent outlet, and the evaporation of water leaves the salt mineral deposit.

The Pacific Highlands give the greatest part of our precious metals.

V. Pacific Slope: West of Cascade and Sierra Nevada Mountains; does not extend to the coast except about Puget Sound. It includes the *Valley of the Willamette* and the valley formed by the *San Joaquin* and *Sacramento Rivers.* The valleys of the slope are very fertile, producing large quantities of fruit and grain. It has but few harbors and few tidal rivers—*Columbia* and *Willamette* are the most important rivers. Near the coast is the Coast Range of mountains.

The trees is this section grow to great size.

(g) Drainage: East of the Atlantic Highlands the land is well drained by the short, rapid rivers that have their sources in the mountains that make up the highlands. The principal rivers are:

1. *Connecticut.* N. E. part of U. S., flows south into Long Island Sound.
2. *Hudson.* N. E. part of U. S., flows south into New York Bay.
3. *Delaware.* N. E. part of U. S., flows south into Delaware Bay.
4. *Susquehanna.* N. E. part of U. S., flows south into Chesapeake Bay.
5. *Potomac.* E. part of U. S., flows southeast into Chesapeake Bay.
6. *James.* E. part of U. S., flows southeast into Chesapeake Bay.
7. *Savannah.* S. E. part of U. S., flows southeast into Atlantic Ocean.

The *Mississippi River* divides the Great Central Plain, and with its branches drains the greater part of it. It flows southerly into the Gulf of Mexico.

The principal branches of the Mississippi are:

East Side—

Ohio, formed by Allegheny and Monongahela, flows southwesterly.

Illinois, which, by the aid of a canal, connects it with Lake Michigan.

West Side—

Missouri, has its source in Rocky Mountains; flows southeasterly.

Arkansas, has its source in Rocky Mountains; flows southeasterly.

Red, has its source in the Plateau Plains in the southern part of U. S., and flows southeasterly.

The rivers of the Lake Slope are short and unimportant.

The Red River of the North is the principal river, and its waters reach Hudson Bay.

The rivers of the Pacific Slope—

(*a*) *Columbia,* has its source in Rocky Mountains, flows southeasterly into Pacific Ocean. Principal branches, *Lewis* or *Snake River,* and the *Willamette,* on southern side.

(*b*) *Sacramento.*

(*c*) *San Joaquin.*

These rivers drain a fertile valley. The general course of the first is south; of the second, north. They both flow into the Bay of San Francisco.

The *Colorado River* has its source in the Rocky Mountains, in the western part of the U. S., flows in a southwesterly direction into the Gulf of California. It drains the Great Plateau. By the overflow of this river a large inland sea has been formed, known as the *Salton Sea.*

In the State of Colorado are the sources of many rivers, whose waters reach the Pacific Ocean and the Gulf of Mexico.

The *Columbia River* is the only river of the U. S. fed by streams out of the country.

The waters of the *Lake of the Woods* reach the Atlantic Ocean by way of the St. Lawrence River after passing through the Great Lakes.

The waters of *Lake George* flow into *Lake Champlain,* thence through the Sorel River into the St. Lawrence.

The lakes of the Great Basin have no apparent outlet.

Minnesota is the great lake state.

The work of reclaiming the *Everglades* of Florida will add 3,000,000 acres of land of the richest character to the territory of that State. This is being done by connecting *Lake Okechobee* by canals with rivers on the Atlantic coast, and connecting the *Caloosahatchee River* with the *Gulf of Mexico.* In connection with these canals the *Everglades* are to be drained by a series of canals that will carry the water to the main canals, and this will leave them dry and fit for man's use.

(h) **Mountains:** I. *Appalachian Mountain System,* extending from Maine to Alabama. It includes the

(*a*) *White Mountains,* in Maine and New Hampshire.

(*b*) *Green Mountains,* in Vermont.

(*c*) *Adirondack Mountains* and *Catskill Mountains,* in New York.

(*d*) *Shawangunk,* in New York and New Jersey.

(*e*) *Schooley Mountains,* in New Jersey.

(*f*) *Blue,* in Pennsylvania.

(*g*) *Allegheny Mountains,* in Pennsylvania, Maryland and West Virginia.

(*h*) *Shenandoah Mountains,* in Virginia and West Virginia.

(*i*) *Blue Ridge Mountains,* in Virginia, North and South Carolina.

(*j*) *Cumberland Mountains,* in Virginia, Kentucky and Tennessee.

The principal mountain peaks of this system are:

1. *Mt. Mitchell,* in North Carolina, 6,710 feet high.
2. *Mt. Washington,* in New Hampshire, 6,290 feet high.
3. *Mt. Marcy,* in New York, 5,344 feet high.

The average height of the system is about 2,000 feet. This system extends northeast and southwest. It begins and ends in foothills or low mountains.

II. *The Rocky Mountain System* extends northwest to southeast. The principal ranges are:

(*a*) *Bitter Root Mountains,* in Washington, Idaho and Montana.

(*b*) *Salmon River Mountains,* in Idaho.

(*c*) *Wind River Mountains,* in Wyoming.

(*d*) *Wasatch Mountains,* in Utah.

(*e*) *Sierra Madre,* in New Mexico and Arizona.

The principal mountain peaks are:

1. *Mt. McKinley,* in Alaska, 20,464 feet high.
2. *Mt. St. Elias,* in Alaska, 18,010 feet high.
3. *Pike's Peak,* in Colorado, 14,147 feet high.

The mountains average nearly 10,000 feet high.

III. *The Pacific Highland System* includes:

(*a*) *Cascade Mountains* in Washington and Oregon.

(*b*) *Sierra Nevada* and *Coast Range,* in California.

The highest peaks of this system are:

1. *Mt. Whitney,* in California, 14,898 feet high.
2. *Mt. Rainier,* in Washington, 14,526 feet high.
3. *Mt. Shasta,* in California, 14,350 feet high.

The average height of the mountains of this system is a little less than those of the Rocky Mountain system. These mountains extend nearly north and south.

(j) **Climate:** In general that of the Temperate Zone; modified by

I. *Winds.* The storms come from both the Atlantic and Pacific Oceans.

(*a*) From the Pacific Ocean passing southeast to Nebraska, and thence east to the Lake region.

(*b*) From the Atlantic passing the West Indies and thence north toward the Lake region.

(*c*) Those originating on the southeastern slope of the Rocky Mountains and moving northeast towards the lakes. This makes the Lake region the great storm center. The interior of the United States becomes, by the changing of the direction of the winds, subject to great and sudden changes in temperature. Changes of over 15° F. are of common occurrence in twenty-four hours north of the Ohio River.

The winds from the Pacific are warm and make the climate in summer and winter nearly alike. The winds of the Atlantic coast in winter are cold and followed by snow. This makes great differences in the temperature in summer and winter.

II. *Elevation.* The mountains of the western part of the United States cause the condensation of the moisture of the winds that blow from the Pacific. This to a degree is true of the Atlantic Highlands, but not to the same extent, because the mountains are not so high.

III. *Proximity to Ocean.* The direction of the winds and the mountain barriers cause the ocean slopes to be the best watered sections of the country. The greatest amount of rain falls in the extreme northwestern and southeastern sections of the United States. The driest section is in Arizona and New Mexico.

The destruction of the forests not only lessens the amount of rainfall, but also permits destructive winds to destroy whole sections of country.

The climate of a country affects its products by increasing or decreasing the productiveness, according to the length of the growing season. The length of the *growing season* of the United States in the south and southeastern part is practically the whole year, while in the northern part it is only 120 days.

The climate affects the productiveness by the amount of moisture that is deposited on the surface. When there is little moisture there are dry and barren wastes, no matter how high the temperature may be.

COAST STATES ARE—

I. Atlantic Coast:

Maine,
New Hampshire,
Massachusetts,
Rhode Island,
Connecticut,
New York,
New Jersey,
Delaware,
Maryland,
Virginia,
North Carolina,
South Carolina,
Georgia,
Florida.

II. Pacific Coast:

Washington,
Oregon,
California.

III. Gulf States:

Florida,
Alabama,
Mississippi,
Louisiana,
Texas.

IV. Lake States:

New York, Lakes Erie and Ontario.
Pennsylvania, Lake Erie.
Ohio, Lake Erie.
Michigan, Lakes Superior, Huron, Michigan.
Indiana, Lake Michigan.
Illinois, Lake Michigan.
Wisconsin, Lakes Michigan and Superior.
Minnesota, Lake Superior.

States on the Canadian Boundary:

Maine,
New Hampshire,
Vermont,
New York,
Pennsylvania,
Ohio,
Michigan,
Minnesota,
North Dakota.
Montana,
Idaho,
Washington.

States on the Mexican Border:

Texas, *New Mexico,* *Arizona,* *California.*

The 45th Parallel North Latitude is the Boundary of

New Hampshire,
Vermont,
New York,
Wyoming (northern),
Montana (southern).

The 45th Parallel North Latitude Crosses the States of

Maine,
Michigan,
Wisconsin,
Minnesota,
South Dakota,
Idaho,
Oregon.

THE MISSISSIPPI RIVER PASSES THROUGH: *Minnesota,* *Louisiana.*

States on the East Bank of the Mississippi River:

Minnesota,
Wisconsin,
Illinois,
Kentucky,
Tennessee,
Mississippi,
Louisiana.

States on the West Bank of the Mississippi River:

Minnesota,
Iowa,
Missouri,
Arkansas,
Louisiana.

NATURAL RESOURCES:

I. Agricultural:

(*a*) *Corn.* New Hampshire, 42 bushels per acre.
Connecticut, 40 bushels per acre.
Indiana, 39 bushels per acre.
Iowa and Illinois each 35 bushels per acre.

The last two states produce the greatest quantity, as the number of acres planted is greater than in other states.

(*b*) *Wheat.* The following states each produce over thirty million bushels per year: In 1911:

(*a*) Kansas, about 54,000,000.
(*b*) North Dakota, about 64,000,00
(*c*) Minnesota, about 65,000,000.
(*d*) Nebraska, about 45,000,000.
(*e*) Indiana, about 39,000,000.
(*f*) Washington, about 36,000,000.
(*g*) Ohio, about 32,000,000.
(*h*) Illinois, about 35,000,000.
(*i*) Missouri, about 34,000,000.

(*c*) *Cotton.* In 1910 Texas produced nearly one-fourth of the cotton crop of the United States, followed by Georgia, Mississippi, Alabama, South Carolina.

(*d*) *Tobacco.* In 1911 Kentucky led all the states in the production and value of the tobacco crop. This state produced about one-third of the whole amount raised; its value was about one-fourth of that of the whole crop in the U. S. It is followed by North Carolina, Virginia, Ohio, Pennsylvania, Wisconsin, Tennessee.

(*e*) *Hay.* New York excels in the production of hay. It produces nearly one-tenth of the whole crop. It is followed by Iowa, Pennsylvania, Ohio, Michigan, Wisconsin, Indiana.

(*f*) *Potatoes.* New York also excels in this crop, producing about one-seventh of the whole crop raised in the United States. The following states rank high in the production of this crop: Michigan, Pennsylvania, Wisconsin, Maine, Ohio, Illinois.

(*g*) *Sugar Beets.* California and Michigan raise five-sevenths of the whole crop.

II. Animal:

1. *Horses.* In value the horse, January 1, 1907, about equaled the combined values of cows, cattle and swine raised in the United States The North Central States raise the largest number.

2. *Cattle and Swine* are raised in greatest number in the Central States. Wherever there is corn, hogs will be raised. Near extensive tracts of grazing land cattle will be bred.

3. *Sheep* are raised to a great extent in the Western States, particularly in the extreme Northwest.

4. *Poultry* is becoming one of the most important products. Its value (1900) was greater than that of the crop of oats. Ohio and Iowa rank first in this product.

III. Mineral:

1. *Coal* (anthracite)—Eastern Pennsylvania; very limited in Colorado and New New Mexico.
   Coal (bituminous)—Pennsylvania, Illinois, West Virginia, Ohio.
2. *Iron*—Minnesota, Michigan, Alabama, Pennsylvania.
3. *Petroleum*—Texas and Louisiana, West Virginia, California, Pennsylvania.
4. *Gas*—Indiana, Pennsylvania, West Virginia, Kansas.
5. *Salt*—Michigan, New York, Kansas, Ohio.
6. *Aluminum*—The clay from which this metal is obtained is found throughout the United States. Arkansas produces it in large quantities.
7. *Zinc*—Kansas, Illinois, Missouri, New Jersey.
8. *Lead*—Idaho, Colorado, Utah, Mississippi Valley. In this product the United States ranks first.
9. *Copper*—Montana, Arizona. In this product the United States ranks among the first.
10. *Silver*—Colorado, Montana, Utah, Idaho. In this product the United States ranks first.
11. *Gold*—Colorado, California, South Dakota, Utah, Arizona, Alaska.
12. *Stone*—
    (*a*) Sandstone—Pennsylvania, Ohio, New York.
    (*b*) Granite—New England.
    (*c*) Slate—New York and Vermont.
    (*d*) Marble—Vermont and Georgia.
    (*e*) Limestone—Indiana.

III. Fisheries: Valued at about fifty-six million dollars annually:

(*a*) DEEP SEA, in states bordering on the Atlantic and Pacific Oceans. The products are:
North Atlantic States, cod, halibut, mackerel, oysters, lobsters.
Maryland and South Atlantic States, oysters and shad.
Gulf States, led by Florida, obtain oysters, red snappers and sponges.
The Pacific States lead in obtaining salmon and oysters.
Alaska is the center of seal fisheries, and obtains large quantities of salmon, cod and halibut.

(*b*) INLAND FISHING:
1. *Lake States,* herring, lake trout, whitefish and yellow perch.
2. *Mississippi Valley States,* German carp, catfish, Buffalo fish, mussels.
3. Wherever there are streams and lakes, trout, bass and pickerel are found.

IV. Water Power: The short, swift rivers of the Atlantic slope afford power for manufacturing purposes. Niagara Falls generates electricity, which is used in many of the neighboring cities and towns.

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